

## N4 Waves and Radiation

### Homework One

1. Sounds are produced when particles vibrate. Why does sound not travel through space?

(1)

2. Which Physics term is defined as “the number of waves which pass a point in one second”?

(1)

3. What are ultrasounds?

(2)

4. State the speed of sound in air. (Remember units!)

(2)

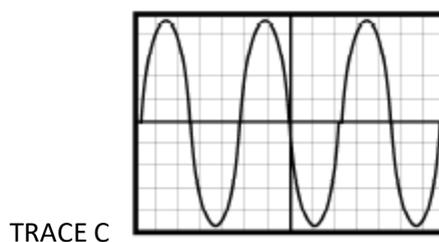
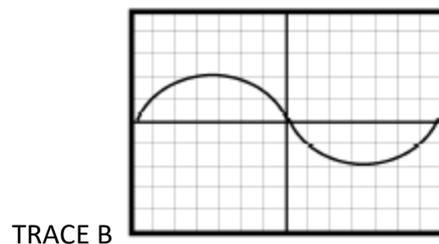
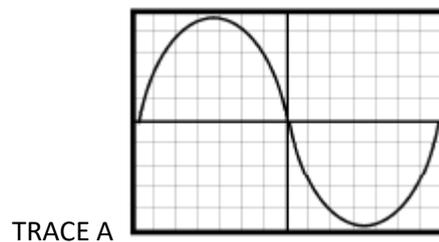
5. Use the CRO traces below to answer the following questions.

a) Which trace displays the quietest sound?

b) Which two traces display sounds with the same amplitude?

c) Which trace displays the sound with the highest frequency?

(4)



## Homework Two

1. The noise from aircraft at airports is an example of noise pollution. Name another example of noise pollution.

(1)

2. a) State the risk to humans caused by noise pollution.

(1)



2. b) Noise cancelling headphones can be used to protect humans from this risk. State another way in which humans can protect themselves from this risk.

(1)

2. c) Explain how noise cancelling headphones “cancel out” unwanted background noise. (A diagram may be used in your answer.)

(2)

3. Noise pollution can be measured on a sound level meter. State the name of the unit used when measuring sound level.

(1)

4. State the approximate sound level for a quiet classroom.

(1)

5. Which type of wave is defined as “the direction of vibration of the particles is at right angles to the direction of wave travel”?

(1)

6. Which type of wave is defined as “the direction of vibration of the particles is in the same direction as the wave is travelling”?

(1)

7. Water waves are an example of transverse waves. True or false.

(1)

### Homework Three

1. a) An explosion at Edinburgh castle is heard four seconds later by a tourist who is 1320 metres from the explosion.



Calculate the speed of the sound waves in air.

(3)

1. b) Sound waves are an example of transverse waves. True or false.

(1)

2. a) A wave machine at a swimming pool produces 4 waves in 20 seconds. Calculate the frequency of the water waves.

(3)

2. b) The wavelength of these water waves is measured as 6 metres. Calculate the wave speed of these water waves.

(3)

## Homework Four

1. State the speed of all waves in the electromagnetic spectrum. (Remember units!)

(1)

2. Which two members of the electromagnetic spectrum are represented by P and Q in the following diagram?

(2)

P	Microwave	Q	Visible	UV	X-ray	Gamma Rays
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3. The information in the following table has been muddled up. Re-draw the table to show all the information in the correct position for all three members of the EM spectrum.

EM Member	Detector	Application
Microwave	GM tube	Detecting broken bones
X-ray	Aerial	Tracers
Gamma rays	Photographic film	Mobile phones

(3)



4. a) UV radiation can harm humans. State two harmful effects that UV radiation can have on skin.

(2)

4. b) State another part of the body that can be damaged by UV radiation.

(1)

4. c) State what can be done to prevent damage to this part of the body.

(1)

## Homework Five

1. Draw a diagram which shows the refraction that takes place when using a convex (or converging) lens on parallel rays of light.

(3)

2. Draw a diagram which shows the refraction that takes place when using a concave (or diverging) lens on parallel rays of light.

(3)

3. A new nuclear power station is being planned.



State two advantages that a nuclear power station will have over a power station that uses fossil fuels.

(2)

4. A disadvantage of a nuclear power station is the radioactive waste materials.

Describe what happens to these radioactive waste materials when they are produced by a nuclear power station.

(2)